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Update on radiation damage investigation of epitaxial p-type silicon using Schottky and pn-junction diodes

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This project focuses on the investigation of trap energy levels introduced by radiation damage in epitaxial p-type silicon. Using 6-inch wafers of various boron doping concentrations (1e13, 1e14, 1e15, 1e16, and 1e17 cm^{-3}) with a 50 μm epitaxial layer, multiple iterations of test structures consisting of Schottky and pn-junction diodes of different sizes and flavours are being fabricated at RAL and Carleton University.

Updates and details on the initial fabrication phase of devices on high resistivity wafers will be given. IV and CV scans of fabricated test structures have been performed and cross-checked between institutes, the results of which will be presented.

In collaboration with Semetrol LLC (USA) and the National Institute of Material Physics, Bucharest-Magurele, Romania, samples of both Schottky and pn-junction diodes have been further investigated using Deep-Level Transient Spectroscopy (DLTS) and Thermal Admittance Spectroscopy (TAS) to characterise trap energy levels in unirradiated devices.

The findings as well as plans for measurements of samples irradiated at the University of Birmingham and the Jožef Stefan Institute, Ljubljana, will be discussed.

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